UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/801,204	03/15/2004	Boon Keat Tan	70040131-1	3118

57299 7590 09/19/2008

Kathy Manke
Avago Technologies Limited
4380 Ziegler Road
Fort Collins, CO 80525

EXAMINER	
NGUYEN, LUONG TRUNG	
ART UNIT	PAPER NUMBER
2622	

NOTIFICATION DATE	DELIVERY MODE
09/19/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

avagoip@system.foundationip.com
kathy.manke@avagotech.com
adrienne.barclay@avagotech.com

Office Action Summary	Application No.	Applicant(s)	
	10/801,204	TAN ET AL.	
	Examiner	Art Unit	
	LUONG T. NGUYEN	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 June 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/26/2008 has been entered.

Response to Arguments

2. Applicant's arguments filed on 6/26/2008 have been fully considered but they are not persuasive.

In re page 16, Applicants argue that "there is no discussion, hint at or suggestion of subtracting dark voltages from color signals where such dark voltages are based on measurements obtained under current operating conditions at which a color sensing circuit is operating. Likewise, there is no discussion, hint at or suggestion regarding fluctuations or variations of dark voltages with current operating conditions, or compensating color signals for such fluctuations or variations."

In response, noted that the feature "fluctuations or variations of dark voltages with temperature, or compensating color signals for such fluctuations or variations" is not claimed. Instead, regarding claim 1, Applicants amended claim 1 with limitations "a color sensor circuit … corresponding to an intensity of said color component occurring under operating conditions;"

"a differential amplifier circuit operably coupled to said color sensor circuit and to said dark color sensor circuit, said differential amplifier circuit being configured to receive said first and second output voltages, remove, using said second output voltage, said dark color offset voltage from said first output voltage, and thereby provide a dark color offset voltage and current operating condition compensated output signal to a differential output thereof representative of said intensity of said color component."

The Examiner considers that Sonoda et al. does disclose "a color sensor circuit … corresponding to an intensity of said color component occurring under current operating conditions." Sonoda et al. discloses output voltages corresponding to color signals R, G, B are outputted from image sensor 1 via amplifiers 2, 3, 4, which occurs at a temperature of surrounding area or environment such as a room temperature, which corresponds to *current operating conditions*, figure 7, column 1, lines 10-67.

Further, Sonoda et al. discloses a signal available on subtraction of the dark voltage form the R signal is outputted from amplification circuit 8, figures 7, 10, column 1, lines 10-67, which corresponds *to provide a dark color offset voltage and current operating condition compensated output signal to a differential output thereof representative of said intensity of said color component*.

In re page 21, Applicants argue that "there is no discussion, hint at or suggestion in Nagasaki or Nelson references regarding subtracting dark voltages from color signals where such dark voltages are based on measurements obtained at current operating conditions at which a

color sensing circuit is operating. Likewise, there is no discussion, hint at or suggestion regarding fluctuations or variations of dark voltages with temperature, or compensating color signals for such fluctuations or variations."

In response, see Examiner's comments regarding this feature as discussed above.

In re page 22, Applicants argue that there is no teaching or suggestion in Sonoda, Nagasaki or Nelson references to produce the invention recited in claims 1 through 21.

It should be noted that claims 1, 4, 6-10, 13-16, 18-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Sonoda et al. Claims 2-3, 11-12, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda et al. in view of Nagasaki et al. further in view of Nelson et al.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

Claim Objections

3. Claims 1-15 are objected to because of the following informalities:

Claim 1 (line 16), "voltage said dark color" should be changed to --voltage, said dark color--.

Claim 9 (line 9), "said current current operating" should be changed to --said current operating--.

Claims 2-8 are objected as being dependent on claim 1.

Claims 10-15 are objected as being dependent on claim 9.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 4, 6-10, 13-16, 18-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Sonoda et al. (US 5,329,111).

Regarding claim 1, Sonoda et al. discloses a color sensing circuit, comprising:

a color sensor circuit configured to provide a light photocurrent from a color component of a light input, said color sensor circuit being configured to provide a first output voltage corresponding to an intensity of said color component occurring under current operating conditions (Sonoda et al. discloses output voltages corresponding to color signals R, G, B are outputted from image sensor 1 via amplifiers 2, 3, 4, and entered differential amplification circuits 8, 9,10 via resistors 8d, 9d, 10d; which occurs at a temperature of surrounding area or

environment such as a room temperature (under current operating conditions), figure 7, column 1, lines 10-67);

a dark color sensor circuit configured to provide a dark photocurrent proportional to said current operating conditions (noted that an output voltage which represents the color temperature of a light source is depend upon room temperature, which corresponds to current operating conditions) and output a second output voltage corresponding to an offset voltage generated by said dark photocurrent under current operating conditions (dark voltage corresponds with R color signal is hold in sample hold circuit 5, the dark voltage is entered differential amplification circuit 8 via resistor 8c , figure 7, column 1, lines 10-67);

a differential amplifier circuit (differential amplification circuit 8, figure 7, column 1, lines 10-67) operably coupled to said color sensor circuit and to said dark color sensor circuit, said differential amplifier circuit being configured to receive said first and second output voltages, remove, using said second output voltage, said dark color offset voltage from said first output voltage, and thereby provide a dark color offset voltage and current operating condition compensated output signal to a differential output thereof representative of said intensity of said color component.

Regarding claims 4, 10, Sonoda et al. discloses wherein said differential amplifier circuit comprises:

a difference amplifier (differential amplifier 8a, figure 7, column 1, lines 10-67) configured to provide said compensated output signal to said differential output and further comprising a positive input, and a negative input;

a feedback resistor (resistor 8b, figure 7, column 1, lines 47-67) having a resistor value with one end coupled to said negative input and another end coupled to said differential output;

a first resistor (resistor 8d, figure 7) having said resistor value coupled in series with a color sensor output configured to provide said first output voltage and said negative input;

a second resistor (resistor 8c, figure 7) having said resistor value coupled in series with a dark sensor output of said dark sensor circuit configured to provide said second output voltage and said positive voltage;

a third resistor (resistor 8e, figure 7) having said resistor value coupled in series to said positive input and to ground.

Regarding claims 6, 13, 19, Sonoda et al. discloses wherein said color component comprises red (figures 6-7, column 1, lines 10-67).

Regarding claims 7, 14, 20, Sonoda et al. discloses wherein said color component comprises green (figures 6-7, column 1, lines 10-67).

Regarding claims 8, 15, 21, Sonoda et al. discloses wherein said color component comprises blue (figures 6-7, column 1, lines 10-67).

Regarding claim 9, Sonoda et al. discloses a color sensing circuit comprising:

a plurality of color sensor circuits, each color sensor circuit being configured to provide a light photocurrent from a color component of light input corresponding thereto, and to output a first output voltage corresponding to an intensity of said color component corresponding thereto that occurs under current operating conditions (voltage indicating intensity of R color signal outputted from amplifier 2 and entered differential amplification circuit 8; voltage indicating intensity of G color signal outputted from amplifier 3 and entered differential amplification circuit 9; voltage indicating intensity of B color signal outputted from amplifier 4 and entered differential amplification circuit 10; the image sensor 1 output these output voltages at a temperature of surrounding area or environment such as a room temperature (current operating conditions), figure 7, column 1, lines 10-67);

a dark color sensor circuit configured to provide a dark photocurrent proportional to said current operating conditions (noted that an output voltage which represents the color temperature of a light source is depend upon room temperature) and output a second voltage corresponding to an offset voltage generated by said dark photocurrent under said current operating conditions (dark voltage corresponds with R color signal is hold in sample hold circuit 5, the dark voltage is entered differential amplification circuit 8 via resistor 8c , figure 7, column 1, lines 10-67);

at least one differential amplifier circuit (differential amplification circuit 8, figure 7, column 1, lines 10-67) operably coupled to said plurality of color sensor circuits and to said dark color sensor circuit and being configured to receive said first and second output voltages, remove, using said second output voltage, said dark color offset voltage from each of said first output voltages, and provide dark color offset voltage and current operating condition compensated output signals corresponding to each of said color components to at least one differential output thereof, each of said output signals representing said intensity of said color component corresponding thereto.

As for claim 16, claim 16 is a method claim of apparatus claim 1. Therefore, see Examiner's comments regarding claim 1.

As for claim 18, see Examiner's comments regarding claim 9.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 2-3, 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda et al. (US 5,329,111) in view of Nagasaki et al. (US 5,502,488) further in view of Nelson et al. (US 5,508,507).

Regarding claims 2-3, 11-12, Sonoda et al. fails to specifically discloses a sensor circuit comprises:

a transimpedance amplifier including an output configured to provide said first output voltage, a negative input, and a positive input;

a feedback resistor with one end coupled to said output and another end coupled to said negative input;

a photodetector configured to detect said photocurrent of said color component and comprising a photodetector input coupled to ground and to said positive input, and a photodetector output coupled to said negative input.

However, Nagasaki et al. discloses a circuit of one pixel of a solid-state imaging device which comprises photodiode 8, the output of the photodiode 8 coupled to the negative input of amplifier 11, the input of the photodiode 8 coupled to ground; the positive input of amplifier 11 coupled to ground; the amplifier 11 includes a feedback resistor (figure 16, column 6, lines 39-45). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Sonoda et al. by the teaching of Nagasaki et al. in order to provide a current-voltage converting circuit, which assures sufficient output voltage.

Sonoda et al. and Nagasaki et al. fail to specifically disclose a compensation capacitor coupled in parallel with said feedback resistor to said output and said negative input. However,

Nelson et al. teaches a combination circuit 51, which includes a compensation capacitor 56, a feedback resistor 54 and operational amplifier 52 (figure 3, column 11, lines 27-36). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Sonoda et al. and Nagasaki et al. by the teaching of Nelson et al. in order to provide a transimpedance amplifier which results in a conversion of current pulse into a corresponding voltage pulse (column 11, lines 27-36).

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda et al. (US 5,329,111).

Regarding claim 5, Sonoda et al. fails to specifically disclose wherein said resistor value approximates a resistance of a feedback resistor in said color sensor circuit. However, Official Notice is taken that it is well known in the art to set the resistor value of a feedback resistor in a differential amplifier approximates resistance of a feedback resistor in a color sensor circuit in order to let the current signal stable. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Sonoda et al. by setting the resistor value of a feedback resistor in a differential amplifier approximates resistance of a feedback resistor in a color sensor circuit in order to let the current signal be stable.

9. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda et al. (US 5,329,111) in view of Nagasaki et al. (US 5,502,488).

Regarding claim 17, Sonoda et al. fails to disclose matching a resistor value for resistors in a differential amplifier circuit, to a resistance of a feedback resistor in a color sensor circuit configured to measure said first voltage, wherein said differential amplifier circuit is configured to receive said first voltage and said offset voltage and outputs said final voltage.

However, Nagasaki et al. discloses a circuit of one pixel of a solid-state imaging device which comprises photodiode 8, the output of the photodiode 8 coupled to the negative input of amplifier 11, the input of the photodiode 8 coupled to ground; the positive input of amplifier 11 coupled to ground; the amplifier 11 includes a feedback resistor (figure 16, column 6, lines 39-45). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Sonoda et al. by the teaching of Nagasaki et al. in order to provide a current-voltage converting circuit, which assures sufficient output voltage.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUONG T. NGUYEN whose telephone number is (571) 272-7315. The examiner can normally be reached on 7:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID L. OMETZ can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LTN
9/14/08

/LUONG T NGUYEN/
Examiner, Art Unit 2622